DUL'NEV, G. N.

Dul'nev, G. N. -- "An Investigation of the Heat Cycles of Semiconductor Thermosensitive Resistances." Cand Phys-Math Sci, Leningrad State Pedagogical Inst, Leningrad 1953. (Referativnyy Zhurnal--Fizika, Jan 54)

SO: SUM 163, 22 July 1954

DUL'NEV, G.N.

Theory of temperature coefficients of semiconductor thermal resistors. [Izd.] Sekts. prib. tepl. kontr. LENITOPRIBOR no.2:112-138 '54.
(Thermistors) (MLRA 8:6)

DUL'NEV, G. N.

USSR/Engineering - Heat FD-2995

Card 1/1 Pub. 41 - 8/12

Author : Dul'nev, G. N. and Kondrat'yev, G. M., Leningrad

Title : The general relationship between the heat inertia of a body and the effects of the outside medium on it.

Periodical : Izv. AN SSSR. Otd. Tekh. Nauk, 3, 130-138, March 1955

Abstract : Describes the mechanics of the experiment and analyzes the data secured. Emphasis is placed on the heat returning ability of a media, its heat conductivity and its heat absorbing ability. It is stated that the purpose of the study is to establish a universal rule by means of which it would be possible to determine the heat radiating ability of an object having a complex form. Graphs, tables, formulae. Two references, both USSR.

Institution :

Submitted : June 10, 1954

DUL'NER, G.N.

Category : USSR/Atomic and Molecular Physics - Heat D-4

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6311

Author : Dul'ner, G.N.
Title : Thermal Regime of a Core of Arbitrary Form, Covered with a Shell.

Orig Pub : Issledovaniya v obl. teplovykh izmereniy. M.-L., Mashgiz, 1956, 112-124

Abstract : No abstract

Card : 1/1

DUL'NEV, G.N.

Category : USSR/Atomic and Molecular Physics - Heat D-4

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3492

Author : Dul'nev, G.N.
Title : Estimate of the Duration of the Irregular Thermal State of Bodies of Arbitrary Shape

Orig Pub : Issledovaniya v obl. teplovykh izmereniy. M.-L., Mashgiz. 1956, 125-135

Abstract : No abstract

Card : 1/1

DUL'NEV, G.N.

Category : USSR/Atomic and Molecular Physics - Heat D-4

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3493

Author : Dul'nev, G.N.
Title : On Systems with Internal and Surface Sources of Energy

Orig Pub : Issledovaniya v obl. teplovykh izmereniy. M.-L., Mashgiz, 1956, 136-149

Abstract : No abstract

Card : 1/1

Category : USSR/Atomic and Molecular Physics - Heat

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 5278 D-4

Author : Dul'nev, G.N., Sevinov, V.P.
Title : On the Accuracy of Temperature Measurement with Semiconductor Heat-Sensitive Resistances.

Orig Pub : Issledovanya v oblasti teplovykh. M.-L., Mashgiz, 1956, 150-158

Abstract : Analysis of the error occurring in the measurement of a temperature with the aid of semiconductor thermoresistances, due to overheating of these resistences by the passage of the measuring current that flows in an unbalanced Wheatstone bridge. A prodedure is given for the design of the circuit for maximum sensitivity. Indications are given on the choice and calculation of the maximum permissible power dissipated in the thermoresistence and its connection with the overheating temperature. Curves are given to illustrate the dependence of the overheating temperature on the permissible dissipation power for various types of semiconductor thermoresistences.

Card : 1/1

Dul'nev, G.N.

Category : USSR/Atomic and Molecular Physics - Heat I-4

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6309

Author : Dul'nev, G.N., Kondrat'ev, G.M.
Title : Generalized Theory of Regular Thermal Regime

Orig Pub : Izv. AN SSSR, Otd. tekhn. n., 1956, No 7, 71-85

Abstract : An analysis is made of the heating or cooling of a body or a system of bodies in the presence of sources of sinks of energy, contained either inside the body or its boundaries. It is assumed that the capacity of the sources and that the ambient temperature are independent of time, and that the coefficient of heat transfer and the thermal property of the materials are independent of the temperature. The regularization of the regime is determined analytically by the fact that the temperature field of the body changes with time exponentially, namely in $(t - u) = -m\tau + G$, (x,y,z), where $u(x,y,z,\tau)$ is the temperature at the point (x,y,z), t (x, y,z) is the limiting temperature, and τ is the time. In analogy with the ordinary theory of the regular regime, m is called the rate of heating of the body, and is independent of

Card : 1/2

DUL'NEV, G. N., Doc Tech Sci -- (diss) "Heat Exchange in Limited Systems of Bodies with Energy Sources." Mos, 1957. 32 pp (Acad Sci USSR, ~~Energetics~~ Power Engineering Inst im G. M. Krzhizhanovskiy), 100 copies. Bibliography at ~~the~~ end of ~~the~~ text (14 titles). (KL, 47-57, 87)

DUL'NEV, G.N.

KONDRAT'YEV, Georgiy Mikhaylovich; KUZ'MIN, M.A., prof., retsenzent; DUL'NEV, G.N., kand.fiz.-mat.nauk, red.; GOFMAN, Ye.K., red. izdatel'stva; SOKOLOVA, L.V., tekhn.red.

[Heat measurement] Teplovye izmereniia. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1957. 244 p. (MIRA 11:1)
(Heat--Measurement)

DUL'NEV, G.N., kand.fiz.-matem.nauk

Theoretic bases for the calorimetric method used in measuring energy varying within the time according to an arbitrary law. Izv. vys. ucheb.zav.; prib. no.2:123-128 '58. (MIRA 11:7)

1. Leningradskiy institut tochnoy mekhaniki i optiki.
(Force and energy--Measurement) (Calorimetry)

DUL'NEV, G.N., kand.fiz.-mat.nauk

Using the theory of regular conditions in determining thermal properties of rocks and building materials. Izv.vys.ucheb.zav.; prib. no.3:110-116 '58. (MIRA 12:2)

1. Leningradskiy institut tochnoy mekhaniki i optiki.
(Rocks—Thermal properties) (Building materials—Thermal properties)

PUL'NEV G. N.

24(8) PHASE I BOOK EXPLOITATION SOV/1826

Akademiya nauk SSSR. Energeticheskiy institut

Teploperedacha i teplovoye modelirovaniye (Heat Transfer and Modeling of Heat Processes) Moscow, Izd-vo AN SSSR, 1959. 419 p. Errata slip inserted. 3,500 copies printed.

Resp. Ed.: M. A. Mikheyev, Academician; Ed. of Publishing House: D. A. Ivanova; Tech. Ed.: G. N. Shevchenko.

PURPOSE: The book is intended for scientists concerned with heat transfer, heat emission, and hydraulics of liquid metals, etc.

COVERAGE: This collection is dedicated to the memory of Academician M. V. Kirpichev who in the twenties initiated a systematic investigation of heat transfer processes and the efficiency of heat apparatus. Later he led the development of research work in this field. Two special collections devoted to works of Kirpichev's school have been published, one in 1938, Materialy soveshchaniya po modelirovaniyu (Materials of the Conference on Modeling) and in 1951, Teoriya podobiya i modelirovaniye (Theory of Similitude and Modeling). The present collection prepared in 1956 represents further development of the work of this school. This theory is fundamental for the analysis of many heat problems in the field of electrical and radio engineering. Of great importance are the first systematic investigations of heat transfer and the hydraulics of liquid metals which as a new kind of heat carrier may be used in the various branches of modern engineering. As a result of special investigations of some cases of convective heat transfer, a dependence of the process on the kind of liquid, temperature, pressure, direction of the heat flow, and other factors, was discovered and established. On the basis of a wide generalization of experimental data, new dependable recommendations for heat analysis of engineering equipment were developed. Of no less interest is the work on heat transmission in boiling liquids and the condensation of vapors. All investigations are based on the theory of similitude, the nature of which, according to M. V. Kirpichev, is that of "experimentation." Work on the theory of a regular regime applied to a system of bodies with an internal source of heat is of interest for the future.

Card 2/20

Heat Transfer (Cont.) SOV/1826

Pul'nev, G. N. Theoretical Bases of the Design of Bunched Cables for Ships 19

A method for adequate bunching of ship cables is given. In this method the following elements are taken into consideration: total thermal regime of the cable depending on various parameters, the degree of load of the mechanisms of the ship which determines the admissible temperature of heating for each bunched cable which generally in an efficiently planned bunching should differ for the different cables, and the physical properties of the rubber insulation of the current-conducting wire on which the life of the cable depends. There are 16 Soviet references.

Denisov, P. P. Experimental Investigation of Thermal Conditions of Bunched Ship's Cables 39

The author presents experimental verification of some assumptions taken in the analytical calculation of cable bunching including physical and geometrical properties of cables, exterior shape of bunches, substitution of multicore cables with hypothetical one core cables, and heat conditions of systems in nonstationary temperature fields. There are 8 Soviet references.

Card 4/20

VULNEV, G.N.

PHASE I BOOK EXPLOITATION SOV/4396

Akademiya nauk SSSR. Energeticheskiy institut

Konvektivnyy i luchistyy teploobmen (Convection and Radiation Heat Exchange) Moscow, Izd-vo AN SSSR, 1960. 234 p. Errata slip inserted. 3,200 copies printed.

Ed.: M.A. Mikheyev, Academician; Ed. of Publishing House: G.B. Gorshkov; Tech. Ed.: V.V. Brusgol'.

PURPOSE: The book is intended for scientists and engineers working in various branches of science and industry concerned with thermodynamics and heat transfer problems.

COVERAGE: The book consists of 19 original articles on various problems in thermodynamics. The following subjects are discussed: mechanism of heat transfer processes, intensification of heat exchange, determination of thermophysical properties of operating media, heat transfer in supersonic flow of gas, and combustion chambers and nuclear reactors. Theory and experimental techniques are described. Each article describes the conditions of the experiment and tables of the experimental data obtained are given. The data may be used for calculations of heat transfer and heat exchangers, always taking account of

Card 1/4

AVAILABLE: Library of Congress

66214
SOV/146-59-1-16/21

~~16(1), 24(8)~~ 24.5200

AUTHORS: Kiknadze, D.A., Post-Graduate Student, and Dul'nev, G.N., Candidate of Physical and Mathematical Sciences

TITLE: The Theoretical Foundation of the Generalized Relation Between the M and H Criteria for Certain Complex Bodies

PERIODICAL: Izvestiya, vysshikh uchebnykh zavedeniy, Priborostroyeniye, 1959, Nr 1, pp 103-109 (USSR)

ABSTRACT: Based on one of the theorems of Professor G.M. Kondrat'yev (Ref.1), who established the relation between the cooling speed m and the heat loss factor α of a body according to the following equation $m = \alpha \frac{S\Psi}{C}$, where S and C - heat dissipating surface and full heat capacity of a body; Ψ - criterion of temperature field irregularity, the authors investigate the formula

$$M = \frac{H}{\sqrt{H^2 + 1.437H + 1}} . \qquad (5)$$

During the past years this formula has been widely used for solving

Card 1/2

66214
SOV/146-59-1-16/21

The Theoretical Foundation of the Generalized Relation Between the M and H Criteria for Certain Complex Bodies

different problems of modern engineering. Since (5) is an approximate formula, its correctness may be checked by comparing its results with data obtained from accurate solutions. However, great mathematical difficulties arise in this case which are not only connected with a solution of the cooling problem of a body of difficult configuration, but also with calculating the values of the criteria M and H according to accurate formulas. The authors present an analytical determination of the dependence between the criteria M and H for the class of cylindrical bodies with entering acute and obtuse angles (γ), as shown in fig.1. The authors emphasize the difficulties involved in the analytical solution. Presenting a numerical example, they show that the formula (5) is theoretically justified for the aforementioned class of bodies. There are 1 diagram, 1 table and 8 Soviet references.

Card 2/2

ASSOCIATION: Leningradskiy institut tochnoy mekhaniki i optiki (Leningrad Institute of Precision Mechanics and Optics)

SUBMITTED: January 28, 1959

4

66193

SOV/146-59-2-20/23

~~16(1)~~ 24,7600

AUTHORS: Kirnadze, D.A., Aspirant, and Dul'nev, G.N., Candidate of Physico-Mathematical Sciences

TITLE: Experimental Verification of Generalized Dependence M=M(H) for Solids of Complex Configuration

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy - priborostroyeniye, 1959, Nr 2, pp 134-138 (USSR)

ABSTRACT: It has been established that the generalized dependence between the heat inertia criterion of solids and the criterion Bio H determining the action of outer medium upon a solid is not enough substantiated for solids having a complex form. A theoretical substantiation of the M=M(H) dependence is possible only for a very small clase of solids; that is why experimental basis of this dependence for complex form solids should really be of interest. For an homogeneous solid of any configuration, criteria M and H are connected in the following way:

$$M = \frac{H}{\sqrt{H^2 + 1.437H + 1}} \qquad (1)$$

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Experimental Verification of Generalized Dependence M=M(H) for Solids of Complex Configuration

$$M = \frac{m}{m_\infty} = \frac{m}{a} K, \quad H = \frac{\alpha}{\lambda} \frac{KS}{V} \qquad (2)$$

where m and m_∞ are rates of the solid cooling at finite and infinite values of the solid heat output coefficient α; λ and a are respectively coefficients of heat conductivity and temperature conductivity of the solid; S, V, and K are the heat output surface, volume, and coefficient of the solid's form. There are two methods of experimental verification of M=M(H) dependence: a) A complex configuration solid is considered; its thermical properties, α, λ, and C are known, and it is possible to calculate the values S, V, and K for the given form of the solid. The rate of cooling and the coefficient of heat output of the solid at variable conditions of heat exchange with the surrounding medium are experimentally determined. By means of dependences (2), experimental values of criteria M and H are calculat-

Experimental Verification of Generalized Dependence M=M(H) for Solids of Complex Configuration

ed and plotted on theoretical graphs of dependence M=M(H) for a sphere and a plate. If the experimental points arrange between these theoretical curves, the generalized dependence for this class of solids is true. b) As in the first case, a complex configuration solid is considered; its parameters α, λ, C (specific heat), S, V and K are known. By using dependence (1), the values of solid's thermal coefficients are determined. If dependence (1) is true for a given class of solids, the experimentally determined values α, λ, and C should coincide with those known from literary sources. As example, the author analyzes two classes of complex configuration solids: 1) A cylinder with entrant angles and 2) a cylinder with an elliptic base. Recommended by the Kafedra teplovykh i kontrol'no-izmeritel'nykh priborov (Chair of Heat- and Control-Measuring Devices). There are 1 graph, 1 diagram, 2 tables and 8 references, 7 of which are Soviet and 1 American.

Card 3/4

66193

SOV/143-59-2-20/23

Experimental Verification of Generalized Dependence M=M(H) for Solids of Complex Configuration

ASSOCIATION: Institut geofiziki AN Gruzinskoy SSR (Institute of Geophysics AS of Georgian SSR); Leningradskiy institut tochnoy mekhaniki i optiki (Leningrad Institute of Precision Mechanics and Optics)

SUBMITTED: February 27, 1959

4

Card 4/4

DUL'KEY, G.N., doktor tekhn.nauk; KRUGLOV, A.A., assistent; RODKEVICH, S.D., dotsent, kand.fiz.-mat.nauk

Calorimetric method for measuring thermal losses in capacitors operating under pulse conditions. Izv.vys.ucheb.zav.; prib. no.3:127-133 '59. (MIRA 13:4)

1. Leningradskiy tochnoy mekhaniki i optiki. Rekomendovana kafedroy radiotekhniki.

(Condensers (Electricity))

69965
S/170/60/003/01/03/023
B022/B007

24,7600

AUTHORS: Dul'nev, G. N., Tarnovskiy, N. N.

TITLE: A Theory of the Heat Behavior of Semiconductor Rectifiers of the Radiator Type

PERIODICAL: Inshenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 1, pp. 18 - 24

TEXT: In the present paper, the analytical relation between the mean temperature of the valve washers of a rectifier of the radiator type and the heat losses of the rectifier are calculated. A simplified scheme of a semiconductor rectifier is given (Fig. 1). Equation (11), which is derived, makes it possible analytically to determine the relation between the mean surface temperature t_{s1} of the rectifier column and the amount of heat losses P under steady heat conditions in dependence on the geometric parameters, the thermo-physical characteristics of the materials, and the conditions during use. The diagrams of the dependence $L = L(\eta)$ (Fig. 2) and $A_2 = A_2(t_m)$ (Fig. 3) are given. The dimensions of the selenium columns used in the control tests are given (Table 1), and the dependence $t_{s1} - t_c = f(P/n)$ is graphically represented on the basis of the calculated

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A Theory of the Heat Behavior of Semiconductor Rectifiers of the Radiator Type

S/170/60/003/01/03/023
B022/B007

and experimental results (Fig. 4). It is shown that the suggested calculation method makes a sufficiently accurate analysis of heat conditions possible. E. F. Trudkova, a student of the Leningradskiy institut tochnoy mekhaniki i optiki (Leningrad Institute of High-precision Mechanics and Optics) took part in the experimental work. There are 4 figures, 1 table, and 3 Soviet references.

ASSOCIATION: Institut tochnoy mekhaniki i optiki, g.Leningrad (Institute of High-precision Mechanics and Optics, City of Leningrad)

Card 2/2

80271
S/170/60/003/02/01/026
B008/B005

24.5200

AUTHORS: Dul'nev, G. N., Tarnovskiy, N. N.

TITLE: Experimental Investigation of the Heat Transfer of Radiators Under Conditions of Natural Convection

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 2, pp. 5-11

TEXT: This paper describes a method of calculating the mean heat-transfer coefficient for typical radiator constructions under conditions of natural convection. The three types of constructions investigated are shown by Fig. 1. The mean heat-transfer coefficient is expressed by the formula $\bar{\alpha} = \sum_i \alpha_i \frac{S_i}{S} \frac{t_i - t'_{mean}}{\bar{t} - t_{mean}}$ (3). i = part of the radiator surface; S = the entire heat-emitting surface; t_i = temperature of each i-surface; $\bar{t}$ = mean temperature of all radiator surfaces; t_{mean} = temperature of the medium.

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80271

Experimental Investigation of the Heat Transfer of Radiators Under Conditions of Natural Convection

S/170/60/003/02/01/026
B008/B005

Formulas are written down for the mean value of air temperature between the heated radiator ribs. They are graphically represented by Figs. 2 and 3. The calculation method was experimentally checked on the three above-mentioned radiator types. A comparison of calculated and experimental values of the temperatures (for radiators of the types A and C) and the mean value of the heat-transfer coefficient (for radiators of the type B) shows a mean divergence of 5-8%. This result is satisfactory for technical calculations. Optimum radiator constructions can be found by applying the calculation method suggested. The relation $\frac{P_{ribbed}}{P_{smooth}} = f_1\left(\frac{S_{ribbed}}{S_{smooth}}\right)$ is given as an example. P_{ribbed} and P_{smooth} are the heat quantities emitted by the respective surfaces. S_{ribbed} and S_{smooth} are the areas of the respective heat-emitting radiator surfaces (Fig. 4). There are 4 figures and 12 references, 11 of which are Soviet.

ASSOCIATION: Institut tochnoy mekhaniki i optiki, g. Leningrad (Institute of High-precision Mechanics and Optics, City of Leningrad)

Card 2/2

Dul'nev, G. N.

S/170/60/003/008/007/014
B019/B054

AUTHORS: Dul'nev, G. N., Tarnovskiy, N. N.

TITLE: Thermal Conditions of Semiconductor Power Diodes

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 8, pp. 61-68

TEXT: The authors deal with the theory and technical computing methods for the thermal conditions of semiconductor power diodes fitted onto a chassis. In the first part, they discuss the heat flows occurring in typical diodes with the aid of Figs. 1 and 2; in the second part, they carry out a detailed mathematical analysis of the steady temperature field in the diode. Proceeding from the heat conduction equations they find solutions which allow the temperature to be calculated in various points of the diode, and the changes in heat exchange coefficients occurring with the temperature changes to be determined. Finally, they briefly deal with the technical calculation of the temperature field of diodes, and state that the methods suggested had been checked experimentally. Deviations not exceeding 5-7% were found to exist.

Card 1/2

Thermal Conditions of Semiconductor Power Diodes

3/170/60/003/008/007/014
B019/B054

There are 3 figures and 6 references, 5 of which are Soviet.

ASSOCIATION: Institut tochnoy mekhaniki i optiki, g. Leningrad
(Institute of Precision Mechanics and Optics, Leningrad)

SUBMITTED: December 18, 1959

Card 2/2

86350

S/146/60/003/005/015/017
B019/B054

6.4600

AUTHOR: Dul'nev, G. N.

TITLE: Heat Balance of a Radioelectronic Apparatus

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Priborostroyeniye, 1960, Vol. 3, No. 5, pp. 116 - 127

TEXT: The author develops an approximation theory for the heat balance in the chassis and radio parts attached to it which are regarded as energy sources. He finds general rules for the heat transfer from the radio parts to the chassis, the casing, and the environment. The knowledge of these rules allows an analytical study of the heat balance of various constructions. A method of calculating the temperature field within the apparatus is given. An experimental checking of this calculation showed that the approximations gave an error of 8-10% which is considered to be satisfactory. The publication of this article was recommended by the Kafedra teplovykh i kontrol'no-izmeritel'nykh priborov (Chair of Heat- and Control Measuring Instruments). There are 4 figures, 2 tables, and 2 Soviet references.

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86350

Heat Balance of a Radioelectronic Apparatus S/146/60/003/005/015/017
B019/B054

ASSOCIATION: Leningradskiy institut tochnoy mekhaniki i optiki (Leningrad Institute of Precision Mechanics and Optics)

SUBMITTED: April 21, 1960

Card 2/2

DUL'NEV, G. N.

"Modern State of Instrument-making industry in the Field of Thermal Measurements."

Report submitted for the Conference on Heat and Mass Transfer, Minsk, BSSR, June 1961.

S/146/61/004/006/016/020
D221/D301

AUTHORS: Dul'nev, G. N., Oleynik, B. N. and Platunov, Ye. S.

TITLE: The present state of and the main problems in thermal instrument design

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Priborostroyeniye, v. 4, no. 6, 1961, 124-131

TEXT: According to the suitability of a method for obtaining the temperature from one experiment, the existing methods can be divided into two categories. The first comprises practically all stationary methods of measuring the heat conductivity except the axial flow in metals; all methods of the regular regime of the first kind (but not the microcalorimeter method); all methods of temperature waves; pulse, probe, mixing and other methods. These are not generally suitable for mass measurements. The second category includes experiments with continuous heating or cooling of specimens over a wide range of temperatures, and may be subdivided into two groups. One embraces tests with a rigorously linear law

The present state of ...

of heating and cooling; these are designated as regular regime methods of the second kind or quasi-stationary methods. The other group contains investigations in conditions of monotonic heating or cooling, and these are designated as dynamic methods or methods of continuous heating. The theoretical investigations of G. P. Ivantsov, A. V. Lykov and G. M. Kondrat'yev form the basis of the first group. These methods were studied by M. Sh. Yagfarov and L. I. Semenov. The methods of the second group were developed at the beginning of 1950. Yu. P. Barskiy at NIIstroykeramika has worked since 1950 on determining the thermophysical properties of materials by measuring the variable heat flow with a diathermal shell. These methods are now mastered for temperatures up to 1200°C. O. A. Krayev at MIPI developed, during 1954-1958, methods of measuring the thermal conductivity of metallic and granulated heat insulating materials and the heat conductivity of fluids. These are based on simplified laws of monotonic heating of the specimen between 20 - 700°C. From 1953, the Leningradkiy institut tochnoy mekhaniki i optiki (Leningrad Institute of Precision Mechanics and Optics) carried out investigations on transient temperature fields. The

The present state of ...

Institute developed methods for measuring the ideal heat capacity and for determining thermal conductivity of hard insulators and thin films. The authors stress the lack of industrial instruments for the above. The absence of unified measurements is a major drawback in perfecting instruments. The Vsesoyuznyy nauchno-issledovatel'skiy institut metrologii im. D. I. Mendeleyeva (All-Union Scientific Research Institute of Metrology im. D. I. Mendeleev) is at present engaged in solving this problem. A reference is made to USA and England where the National Laboratories offer standard samples of substances. The Leningrad Institute of Precision Mechanics and Optics organized in December 1960 the second conference of schools of higher education to examine methods and instruments for measuring the thermophysical properties of materials. The conference made the following resolutions: 1) Concentrate at the Mendeleyev Institute work on prototypes; 2) subject to a state examination the instruments intended for industrial manufacture; 3) form a commission for thermophysical measurements as the coordinating center; 4) establish a design office and prototype production for instruments; 5) foster research in the field of high

Card 3/4

The present state of ...

temperatures; 6) convene an All-Union conference no later than in 1963 to debate the methods and instruments for thermophysical experiments. This article was recommended by the Kafedra teplovykh i kontrol'no-izmeritel'nykh priborov (Department of Thermal and Control-Measuring Instruments). There are 56 references: 42 Soviet-bloc and 14 non-Soviet-bloc. The references to the 4 most recent English-language publications read as follows: W. H. Sutton, J. Amer. Ceram. Soc., v. 43, no. 2, (1960); C. L. Langmuire, Rev. Scient. Instrum., v. 98, no. 11, (1957); W. E. Haupin, Amer. Ceram. Soc. Bull., v. 39, no. 3, (1960); Taga Masao, Trans. Japan Soc. Mech. Eng., (1959), 25, no. 160, 1274-1281.

ASSOCIATION: Leningradskiy institut tochnoy mekhaniki i optiki (Leningrad Institute of Precision Mechanics and Optics)

SUBMITTED: June 19, 1961

Card 4/4

S/862/62/001/000/001/012
E032/E314

AUTHORS: Begunkova, A.F., Dul'nev, G.N. and Platunov, Ye.S.

TITLE: Instruments developed at LITMO for thermophysical measurements

SOURCE: Teplo- i massoperenos. t. 1: Teplofizicheskiye kharakteristiki materialov i metody ikh opredeleniya. Ed. by A. V. Lykov and B. M. Smol'skiy. Minsk, Izd-vo AN BSSR, 1962. 3 - 10

TEXT: Instruments and apparatus developed between 1953 and 1960 at the Leningrad Institute for Precision Mechanics and Optics are reviewed. The first group of instruments is designed for thermophysical measurements on thermally insulating and constructional materials at room temperatures. They are based on the regular temperature variation methods developed by Professor G.M. Kondrat'yev (Teplovyye izmereniya (Thermal measurements), Mashgiz, 1957). The second group includes apparatus also based on Kondrat'yev's theories and used in rapid determinations of the temperature-dependence of various thermophysical characteristics of materials between -100 and 1 100 °C. Only very general descriptions are

Card 1/2

S/662/62/001/000/001/012
E032/E314

Instruments developed ....

given; detailed accounts are available in previously published papers. The present review is based on 13 Soviet papers, published between 1954 and 1962. There are 5 figures.

ASSOCIATION: Leningradskiy institut mochnoy mekhaniki i optiki (Leningrad Institute of Precision Mechanics and Optics)

Card 2/2

S/170/62/005/004/013/016
B104/B102

AUTHORS: Begunkova, A. F., Dul'nev, G. N., Platunov, Ye. S., Semyashkin, E. M., Cherkasov, V. N., Yaryshev, N. A.

TITLE: Normal thermal conditions of bodies of complex shape

PERIODICAL: Inzhenerno-fizicheskiy zhurnal. v. 5, no. 4, 1962, 122 - 126

TEXT: In the "Inzhenerno-fizicheskiy zhurnal", no. 8, 1961, a paper by G. N. Tret'yachenko and L. V. Kravchuk entitled "Normal thermal conditions of complex bodies" was published. In this paper, some "fundamental errors" of the founder of the theory of normal thermal conditons, G. M. Kondrat'yev and his followers, are pointed out. In the present paper, some assumptions of the theory set up by Kondrat'yev are explained, and it is shown that the authors of the paper mentioned misunderstood the term "normal thermal conditions". This is discussed in detail by citing the corresponding passages of the text and by using the symbols introduced there. There are 8 Soviet references.

Card 1/2

DUL'NEV, G.N.

Regularization of temperature fields. Inzh.-fiz.zhur. 5 no.9:112-117 S '62. (MIRA 15:8)

1. Institut tochnoy mekhaniki i optiki, Leningrad.
(Solids—Thermal properties)

BEGUNKOVA, A. P.; DUL'NEV, G. N.; PLATUNOV, Ye. S.

Instruments for thermophysical measurements designed by the Leningrad Institute of Precision Mechanics and Optics. Teplo- i massoper. 1:3-10 '62. (MIRA 16:1)

1. Leningradskiy institut tochnoy mekhaniki i optiki.

(Calorimeters)

DUL'NEV, G.N.; KAGANOV, M.A.; KISNER, I.S.

"Fundamentals of heat transfer by radiation" by A.G.Blokh. Reviewed by G.N.Dul'nev, M.A.Kaganov, I.S.Lisker. Inzh.-fiz. zhur. 5 no.10: 130-131 O '62. (MIRA 15:12)

(Heat—Transmission) (Heat—Radiation and absorption) (Blokh, A.G.)

AM4007085 BOOK EXPLOITATION S/

Dul'nev, Gennadiy Nikolayevich

Heat exchange in radio electronic equipment (Teploobmen v radioelektronny*kh ustroystvakh). Moscow, Gosenergoizdat, 1963. 287 p. biblio. Errata slip inserted. 10,500 copies printed.

TOPIC TAGS: electronic component heat exchange, heat exchange analysis, electronic assembly thermal conductivity, thermistor, resistor, transistor, semiconductor diode

PURPOSE AND COVERAGE: This book is intended for engineering and technical personnel concerned with the problems of designing and increasing the reliability of radio electronic devices. It may also be of use to teachers, aspirants, and students of radio engineering and heat engineering specialties. The book deals with radio electronic devices and components. Thermal operating conditions of radio electronic devices such as thermistors, r-f resistors, radiator-type rectifiers, semiconductor diodes and triodes, and r-f transformers are discussed in particular. Methods of calculating the relationship of

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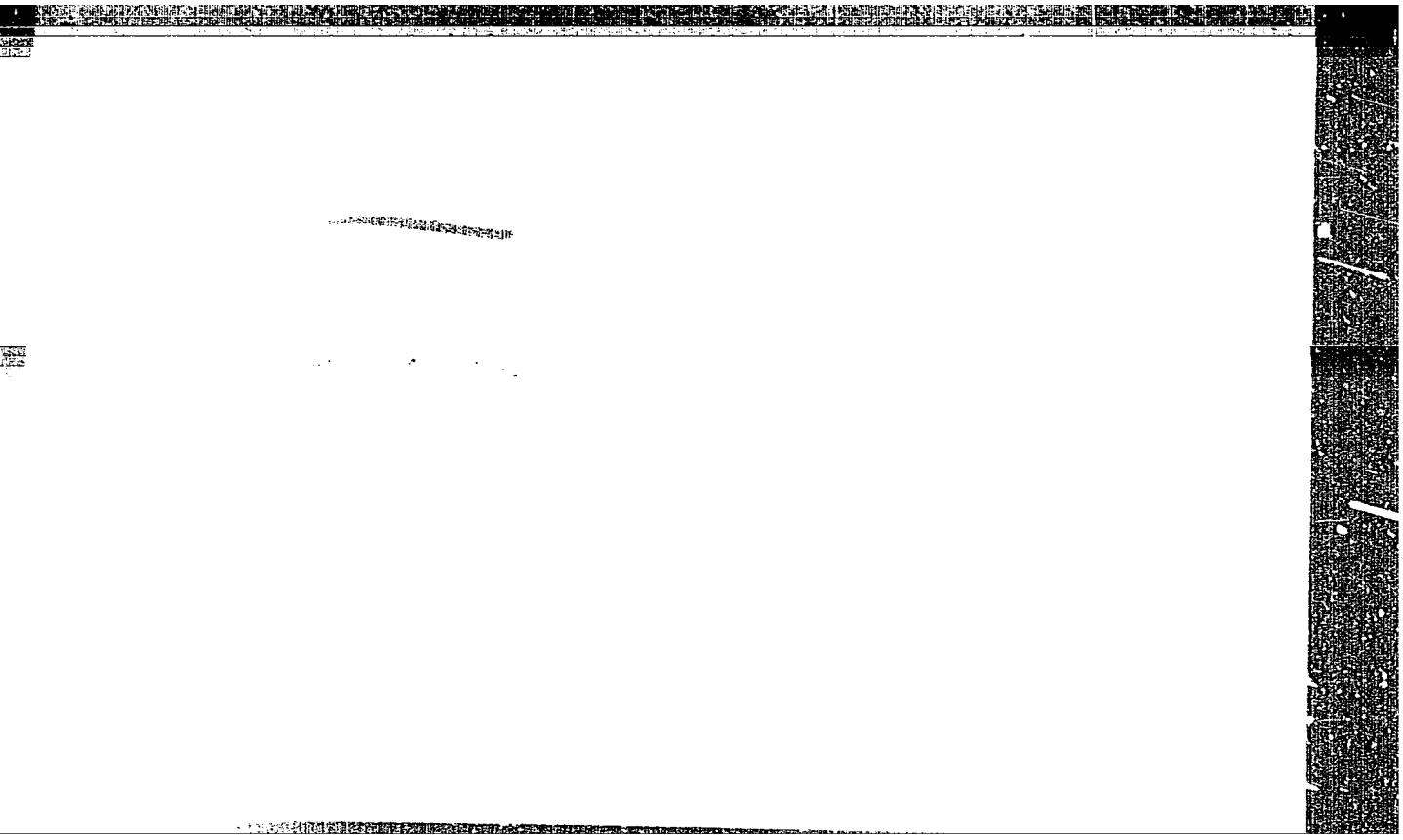
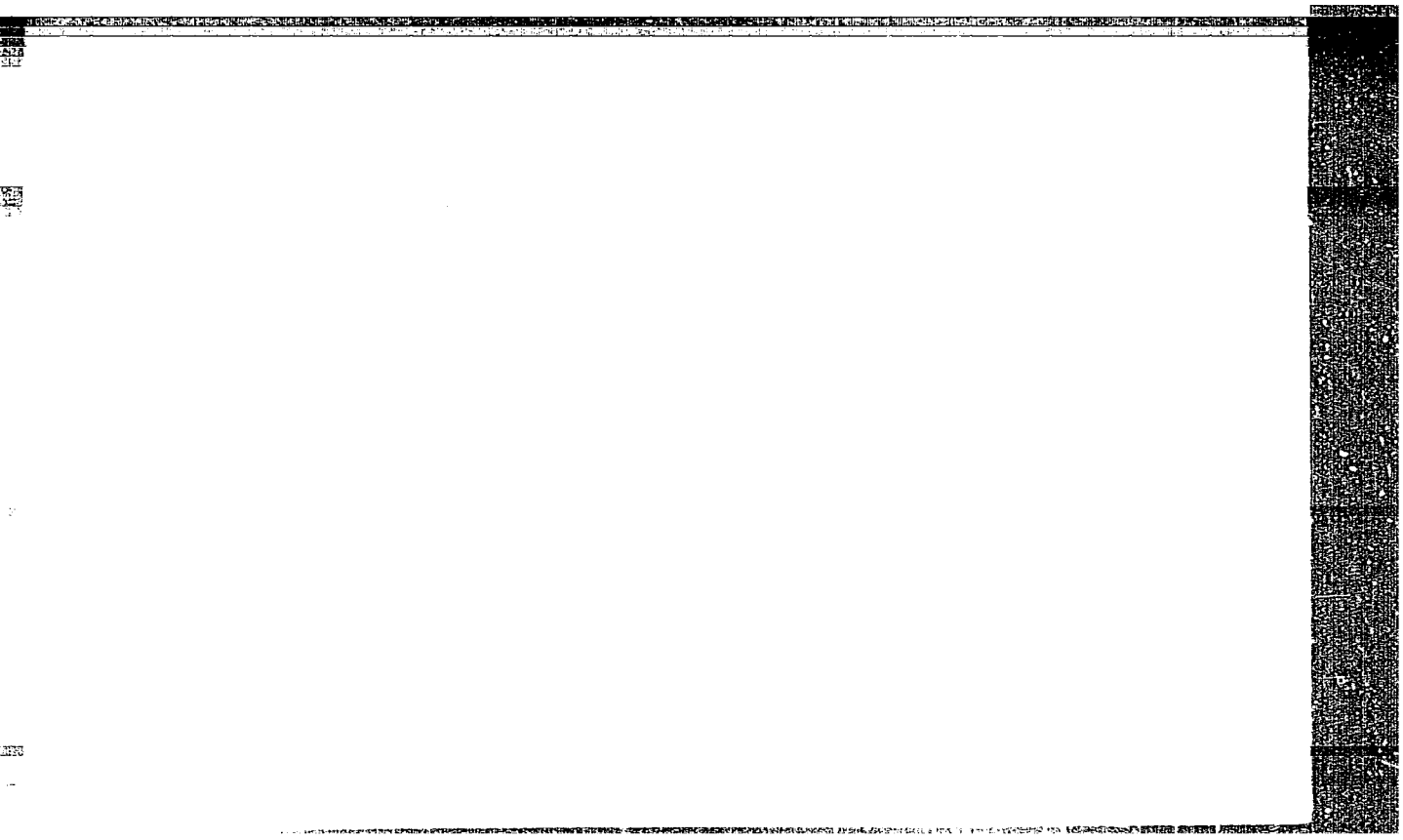
AM4007085

temperature in various points of radio electronic devices and the power sources are suggested. Special attention is paid to the analysis of the influence of various parameters on the thermal operating conditions of radio electronic devices. N. N. Tarnovskiy and V. N. Cherkasov, Engineers, and E. M. Semyashkin, Candidate of Technical Sciences, are thanked for their assistance.

TABLE OF CONTENTS:





ACCESSION NR: AP4041654 S/0146/64/007/003/0101/0107

AUTHOR: Dul'nev, G. N.; Kaydanov, A. I.

TITLE: Thermal conditions in multiple-unit structures of electronic equipment

SOURCE: IVUZ. Priborostroyeniye, v. 7, no. 3, 1964, 101-107

TOPIC TAGS: electronic equipment, thermal effect, temperature field, multiple unit electronic equipment

ABSTRACT: A new method for analysis of the thermal conditions in multiple-unit cabinet-type electronic equipment is offered. Approximating the real structure by a theoretical parallelepiped with "heated zones" and spaces between them, the average surface temperatures are calculated by a method of electric-thermal analogy; this method uses Kirchhoff's equations for calculating thermal circuits. Equations for a 3-unit structure are set up, and the iteration method is recommended for simplifying the set of equations. A simplification of the equivalent

ACCESSION NR: AP4041654

circuit may be obtained by assuming the vertical conductance equal first to 0, then to ∞ ; the necessary correction factor may be obtained from a simulator. Potentialities of the method were verified by experiments (no details reported) and calculations on a "Mersedes" electromechanical computer and on an EMV-LITMO electronic computer; tabulated results show satisfactory agreement between estimated and experimental values. Orig. art. has: 4 figures, 5 formulas, and 1 table.

ASSOCIATION: Leningradskiy institut tochnoy mekhaniki i optiki (Leningrad Institute of Fine Mechanics and Optics)

SUBMITTED: 10Oct63 ENCL: 00

SUB CODE: EC, TD NO REF SOV: 005 OTHER: 000

Card 2/2

ACCESSION NR: AP4043567 S/0146/64/007/004/0137/0142

AUTHOR: Dul'nev, G. N.; Karapetyan, A. M.

TITLE: Heat transfer and mass transfer in unitized electronic equipment

SOURCE: IVUZ. Priborostroyeniye, v. 7, no. 4, 1964, 137-142

TOPIC TAGS: electronic equipment, mass transfer, mass transfer cooling, heat transfer

ABSTRACT: A theoretical investigation is presented of the heating and cooling conditions in unitized-design electronic equipment which consists of a number of subunits stacked in top- and bottom-perforated housing. Formulas are developed for relations between the power of the energy sources, temperatures at individual points of the equipment, and the geometrical and physical parameters influencing the processes of heat transfer and mass transfer. These assumptions are made: (a) the gas temperature varies linearly with height; (b) the housing temperature

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ACCESSION NR: AP4043567

varies linearly with height; (c) a single heat removal coefficient for all smooth surfaces and a single coefficient for all rough surfaces; (d) the gas is transparent for thermal radiation; (e) steady-state conditions are considered. Orig. art. has: 2 figures and 23 formulas.

ASSOCIATION: Leningradskiy institut tochnoy mekhaniki i optiki (Leningrad Institute of Fine Mechanics and Optics)

SUBMITTED: 24Dec63 ENCL: 00

SUB CODE: EC NO REF SOV: 002 OTHER: 000

Card 2/2

DUL'NEV, G.N.; SIGALOVA, Z.V.

Thermal conductivity of granular systems. Inzh.-fiz. zhur. no.10: 49-55 O '64. (MIRA 17:11)

1. Institut tochnoy mekhaniki i optiki, Leningrad.

DUL'NEV, G. N.; PLATUNOV, E. S.; KUREPIN, V. V.; BURAVOY, S. E.

"Some new methods and equipment for the investigation of the thermal properties of materials developed at Leningrad Inst of Precise Mechanics and Optics."

Leningrad Inst of Precision Mechanics & Optics.

report submitted for 2nd All-Union Conf on Heat & Mass Transfer, Minsk, 4-12 May 1964.

DUL'NEV, G.N.

Heat transfer through solid disperse systems. Inzh.-fiz. zhur. 9 no.3:399-404 S '65. (MIRA 18:9)

1. Institut tochnoy mekhaniki i optiki, Leningrad.

ACC NR: AP6033278 SOURCE CODE: UR/0141/66/009/005/0849/0858

AUTHOR: Dul'nev, G. N.; Zarichnyak, Yu. P.; Muratova, B. L.

ORG: Leningrad Institute of Precision Mechanics and Optics (Leningradskiy institut tochnoy mekhaniki i optiki)

TITLE: Possible structure of the surface layer of the Moon

SOURCE: IVUZ. Radiofizika, v. 9, no. 5, 1966, 849-858

TOPIC TAGS: lunar surface, thermal conduction, lunar reflectivity, heat transfer, porosity

ABSTRACT: To check whether information concerning the surface layer of the Moon can be determined from measurements of the Moon's temperature and thermal conductivity, the authors derive an analytic expression for the effective thermal conductivity of bodies having a structure that may be possibly possessed by the material of the Moon, namely intermediate between mineral dust and a solid porous body of mineral origin under deep vacuum condition, which the authors call "dendritic." The authors then calculate the effective thermal conductivity of a dendritic structure under condition of deep vacuum (10^{-4} mm Hg) at temperatures from 0 to 30K. Most of the heat transfer is assumed to be via the solid matter, and radiative and molecular heat transfer are neglected. The calculation consists essentially of determining the heat conduction of bars of variable cross section and then allowing for the random distribution of the bars and of the pores between them. A value of 0.055 W/m-deg is obtained for the

 UDC: 536.2: 523.3

ACC NR: AP6033279

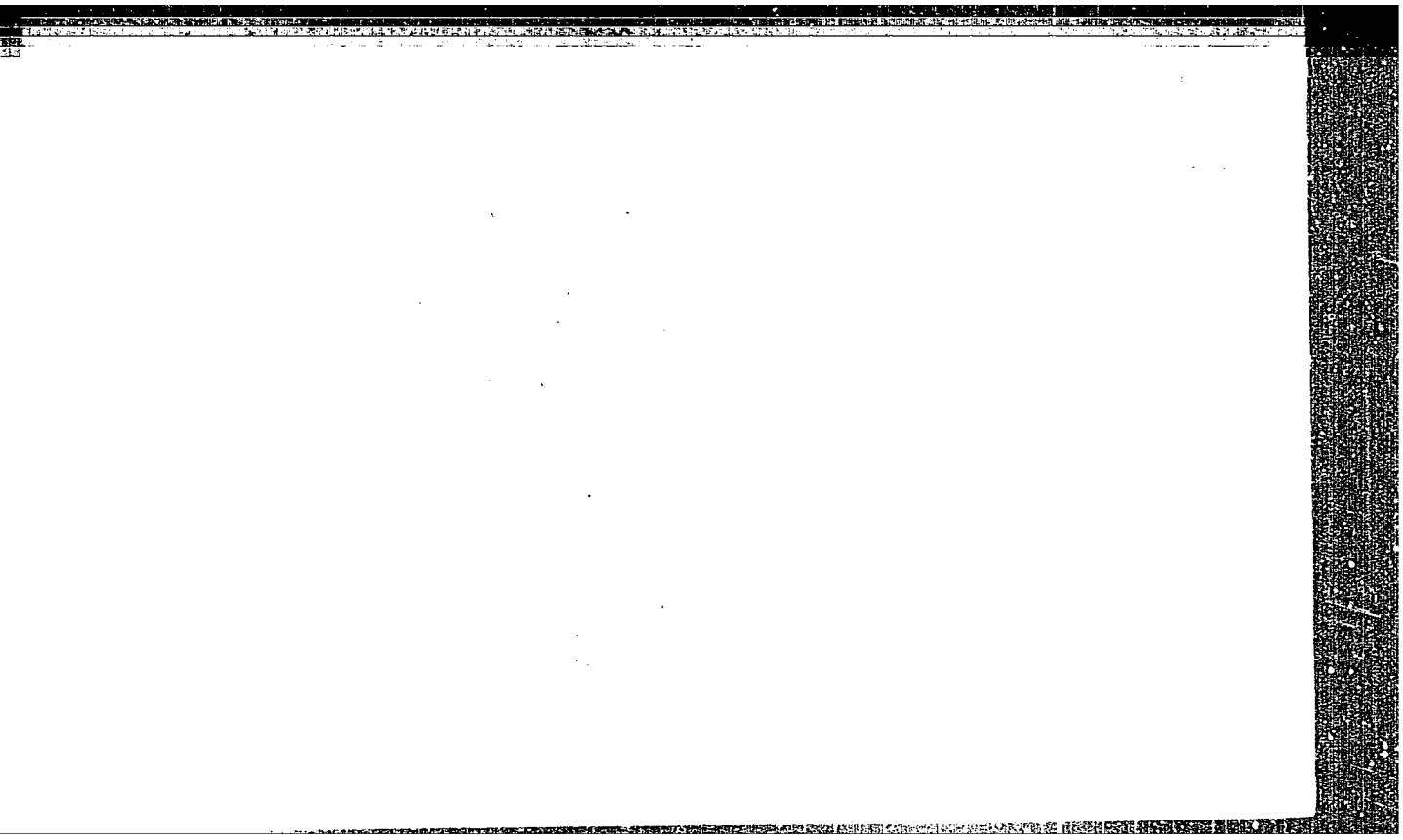
effective thermal conductivity of such a structure, as against 0.04 obtained from astrophysical measurements and assumptions concerning the density and heat capacity of the lunar surface. It is concluded that to determine the structure of a body from its effective thermal conductivity it is necessary to have additional information on on the structure of the body, namely its porosity, the relative variation in the thickness of the solid frame of the body, and others. Although a unique determination of the structure of the body from its effective thermal conductivity is still impossible, it may provide an answer to the problem in conjunction with other data. Orig. art. has: 5 figures and 27 formulas.

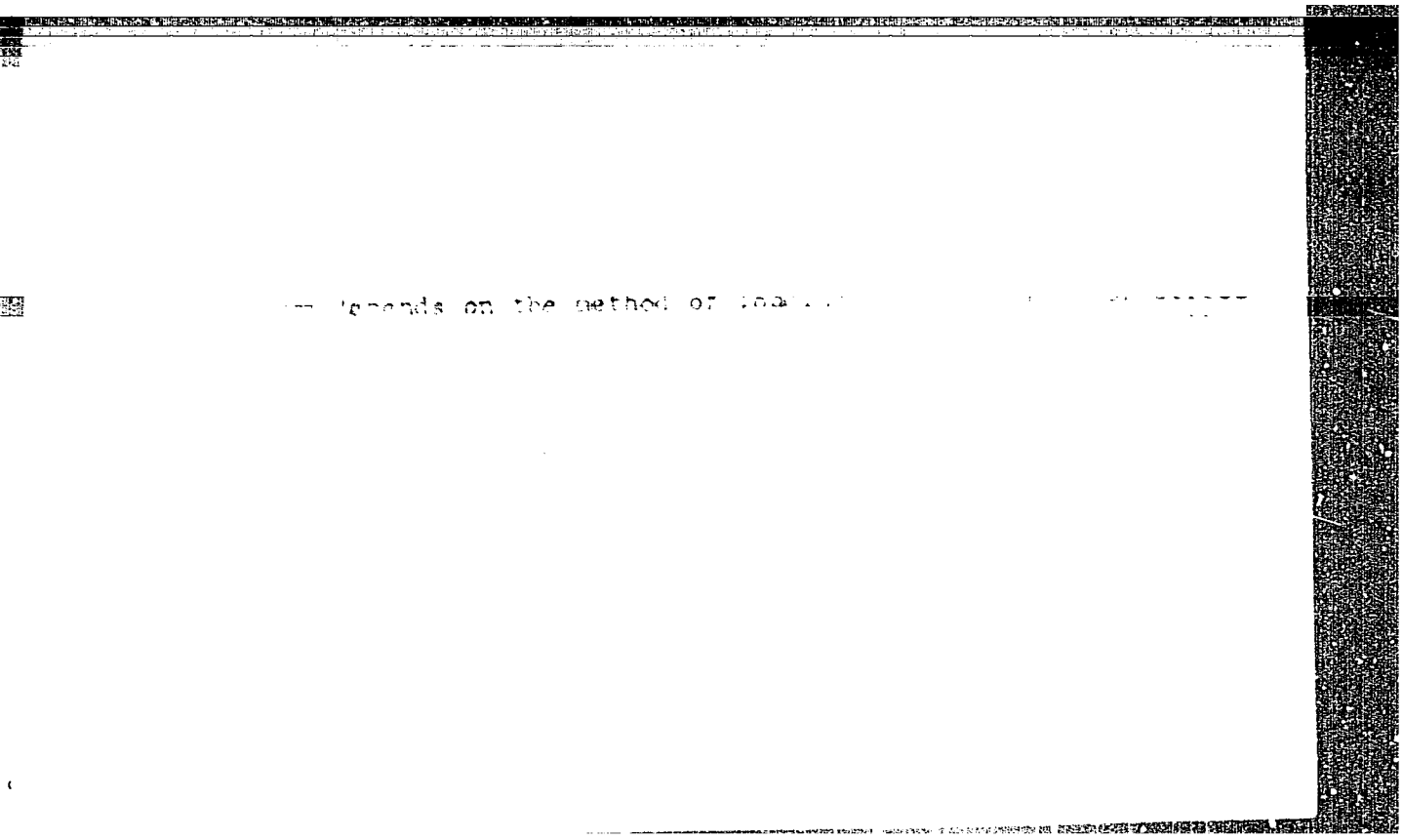
SUB CODE: 20/03/ SUBM DATE: 20Jan66/ ORIG REF: 007/ OTH REF: 003

Card 2/2

DUL'NEV, M.I.

Automatic moisture eliminator. Mashinostroitel' no 5:27 My '64. (MIRA 17:7)





ACCESSION NO: AP4020048 S/0032/64/030/003/0340/0347

AUTHORS: Shorr, B. F.; Dul'nev, R. A.

TITLE: Investigation of temperature stresses and creep during variations in temperature

SOURCE: Zavodskaya laboratoriya, v. 30, no. 3, 1964, 340-347

TOPIC TAGS: creep, thermal stress, temperature change, shearing stress, thermal fatigue, strength, material failure, static failure

ABSTRACT: This is a survey of a great number of papers, Soviet and others, relative to strength of materials when subjected to changes in temperature. It is pointed out that increase in temperature affects the thermal resistance directly (by changing mechanical properties) and indirectly (by formation of thermal stresses from expansion). Many papers have been written on thermal fatigue, and it has been found that shearing stresses play a dominant role in the failure of material because of thermal fatigue. In some cases a connection has been found between characteristics of thermal fatigue and static failure. Some authors have proposed using steady static loading to test thermal fatigue. This survey of the literature points out that future advances in studying thermal resistance at different

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ACCESSION NO: AP4020048

temperatures will depend chiefly on investigation of the actual conditions of the operating parts under natural conditions. Standard methods must be developed for comparative tests of materials applicable to definite conditions of operation, and it is urgent to study the kinetics of the processes leading to fractures and failure and to work up a proper technical theory of strength. Orig. art. has: 6 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 27Mar64 ENCL: 00

SUB CODE: AP / NO REF SOV: 043 OTHER: 019

Card 2/2

ACCESSION NR: AP4033619 S/0032/64/030/004/0468/0472

AUTHORS: Serensen, S. V.; Dul'nev, R. A.

TITLE: Method for investigating temperature fields around specimens during thermal fatigue stress

SOURCE: Zavodskaya laboratoriya, v. 30, no. 4, 1964, 468-472

TOPIC TAGS: temperature field, thermal fatigue, thermal conductivity, heat balance, rod perimeter, thermocouple

ABSTRACT: Experimental and analytical studies were made on L. F. Coffin (Trans. ASME, S.T.P., No. 165, 1954) type equipment to investigate temperature fields around alloy rods during thermal fatigue tests. The temperature field was assumed to be symmetric with respect to the specimen mid-section (see Fig. 1 on the Enclosure). It was further assumed that T was constant across the rod thickness, and that λ (the thermal conductivity) was independent of T. A heat balance between the midsection and the supporting wall, plus losses to the atmosphere, led to the expression for temperature T,

$$T = \left(T_0 + \frac{B}{A}\right)\frac{\mathrm{ch}(x\sqrt{A})}{\mathrm{ch}(l\sqrt{A})} - \frac{B}{A},$$

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ACCESSION NR: AP4033619

where A and B are functions of λ, rod perimeter, density, and heating current I. Temperature measurements with 15 chromel-alumel thermocouples indicated values three times higher than those predicted by the above equation. This discrepancy was subsequently alleviated by introducing steel sleeves inside the test rods. These served as temperature equalizers. Orig. art. has: 9 formulas and 4 figures.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 01

SUB CODE: TD, MM NO REF SOV: 008 OTHER: 002

Card 2/3

ACCESSION NR: AP4033619

ENCLOSURE: 01

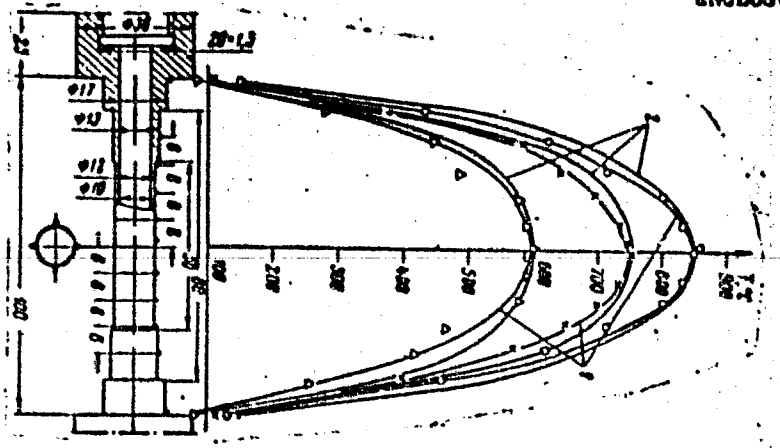

Fig. 1. Temperature distribution in EI437B alloy specimen, obtained experimentally (Curve 1) and theoretically (Curve 2).

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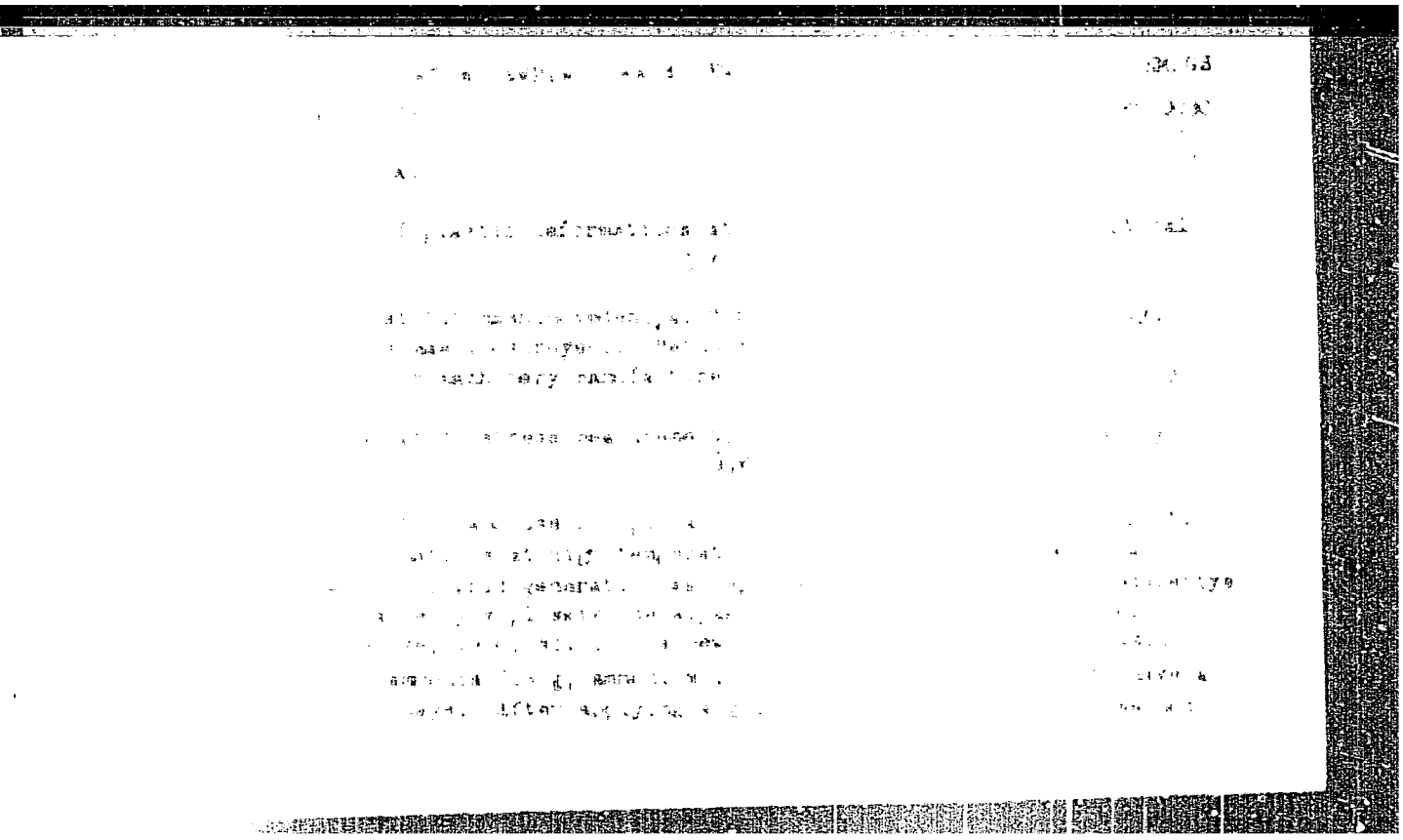

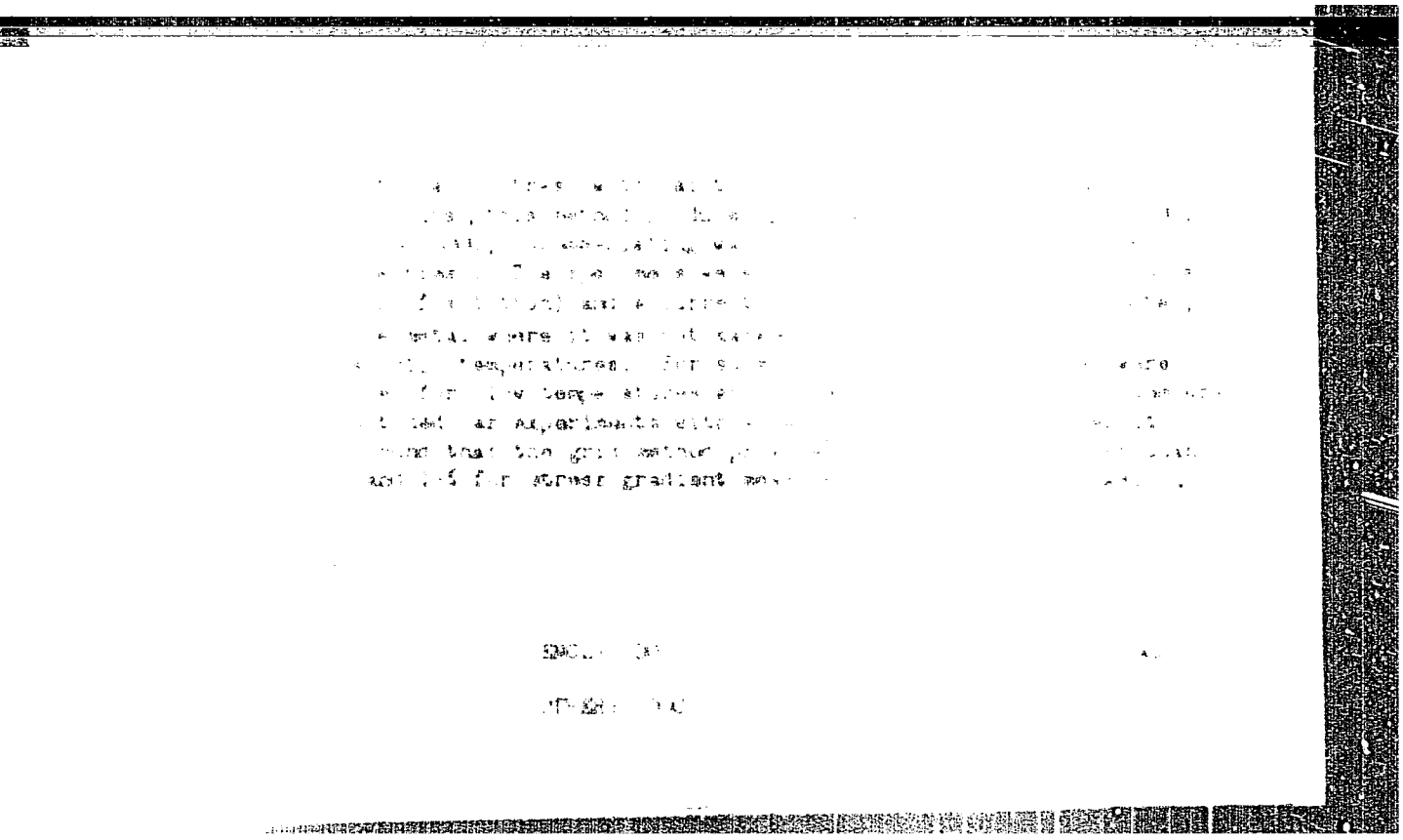

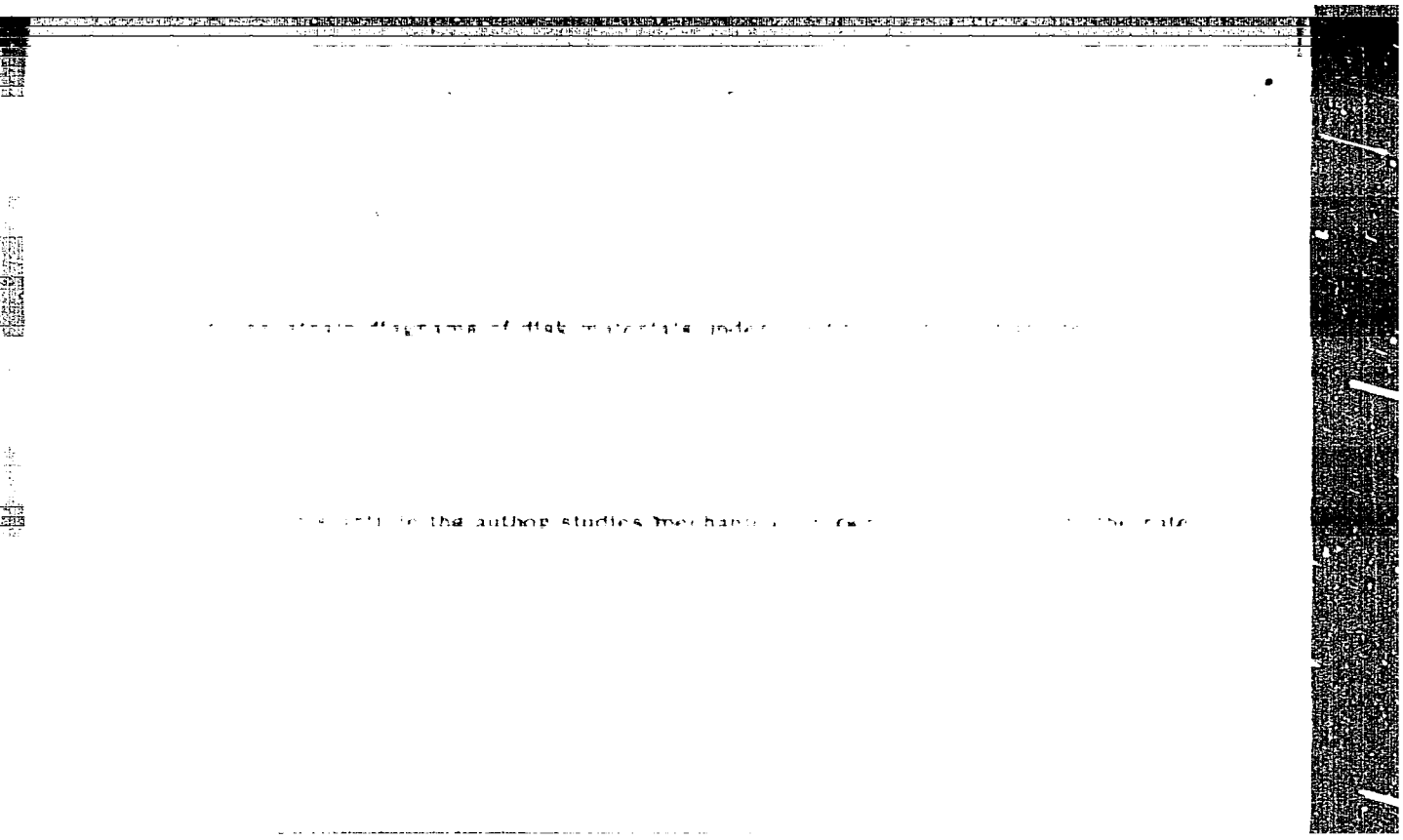

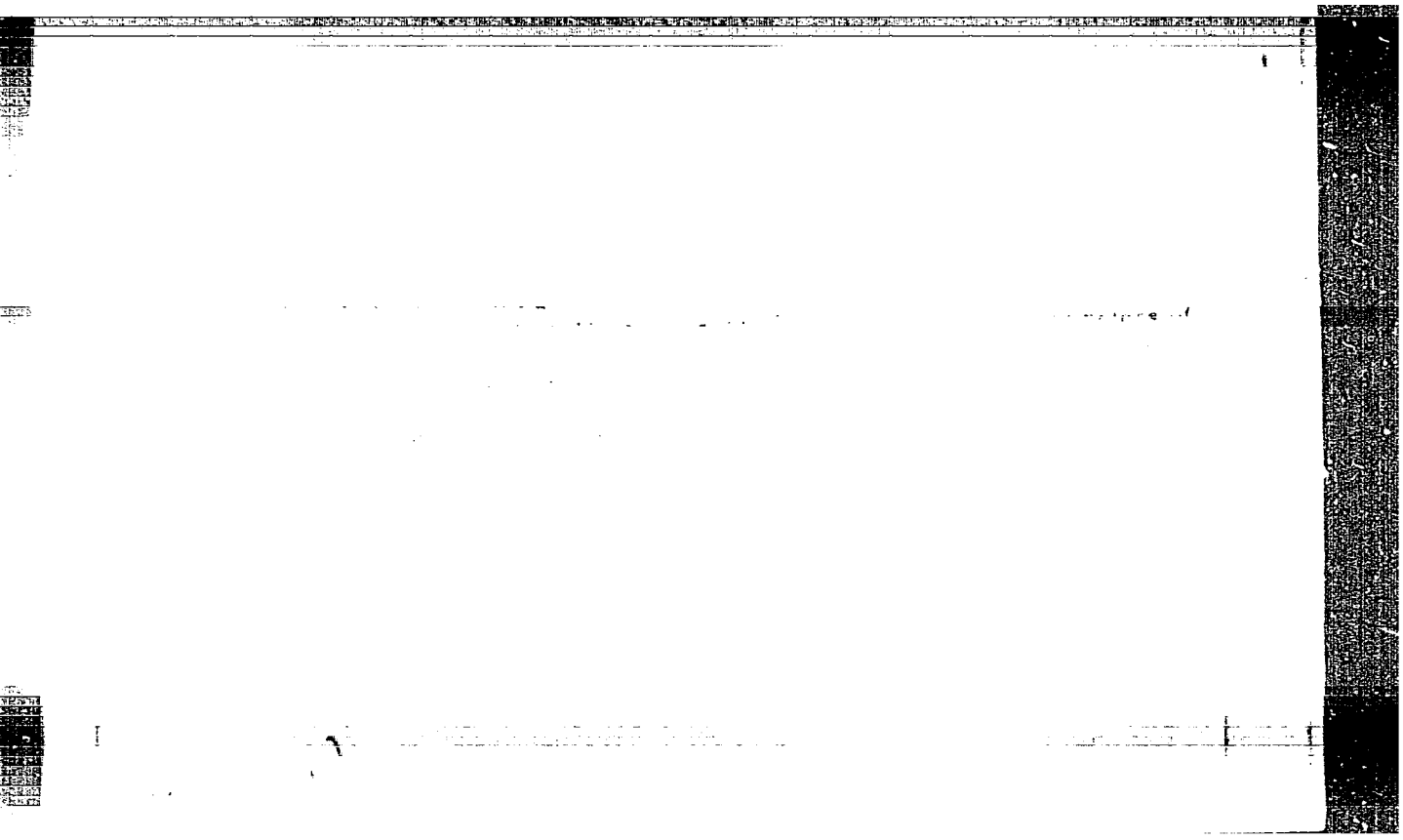

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00041151(

L 06594-67 EWT(m)/EWP(w)/EWP(t)/ETI IJP(c) JD/WW/EM

ACC NR: AP6029858 SOURCE CODE: UR/0032/66/032/008/0988/0991

AUTHOR: Dul'nev, R. A.

ORG: none

TITLE: Testing for thermal fatigue by soaking at the maximum temperature of the cycle

SOURCE: Zavodskaya laboratoriya, v. 32, no. 8, 1966, 988-991

TOPIC TAGS: thermal fatigue, alloy steel, heat resistant steel, stress measurement, stress relaxation, temperature dependence, endurance limit / EI867 steel

ABSTRACT: A Coffin-type apparatus was used to test EI867 steel for thermal fatigue by soaking at the maximum temperature of the cycle (T_{max}) for times ranging from 1.5 to 10.7 min. A schematic diagram of the apparatus and electric circuitry is shown. Heating to T_{max} took 40-50 sec, while cooling to T_{min} took 30-40 sec. During soaking at T_{max} the temperature variation nevery exceeded 1%. The change of stress in the samples was given as a function of time for 4 succeeding cycles after heating to a T_{max} of 800°C. In the first cycle the compressive stress reached a maximum of -90 kg/mm^2 at $T < T_{max}$, dropped sharply to -60 kg/mm^2 after 1.5 min, and decreased further to -50 kg/mm^2 after 6.5 min. The decrease in stress with time was caused by stress relaxation

Card 1/2 UDC: 620.17

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ACC NR: AP6029858 O

due to creep. Since the specimen was securely clamped, it did not expand and the total strain was represented by: $$\varepsilon_t = \varepsilon_e + \varepsilon_p = \varepsilon_e^* + \varepsilon_p + \varepsilon_{creep} = 0,$$

where ε_t is the thermal deformation, determined by T_{max}-T_{min}; ε_e and ε_p are the initial values of elastic and plastic deformation, determined by the value of load at T_{max}; ε_{creep} is the value of creep strain, determined from the load, time, and temperature; $\varepsilon_e^* = \varepsilon_e - \varepsilon_{creep}$ is the residual elastic deformation. Upon cooling to 100°C, the stress became tensile (90 kg/mm^2). With cycling, a similar sequence was observed although the curve shifted and the maximum compressive stress gradually dropped. Eventually, a stabilization process resulted in a constant value of stress as a function of time for repeated cycling. Endurance curves are shown for tests conducted at T_{max} = = 800°C and T_{max} = 900°C, with T_{min} = 100°C. The number of cycles to failure decreased sharply with increase in soaking time. These changes were caused by creep deformation which was appreciable even at 1.5 min. For each cycle the stress relaxation was estimated to be 50%. Orig. art. has: 3 figures, 1 formula.

SUB CODE: 11,20/ SUBM DATE: none/ ORIG REF: 003/ OTH REF: 001

Card 2/2 LS

DUL'NEV, V.P., starshiy nauchnyy sotrudnik, kandidat tekhnicheskikh nauk.

Division of bed loads in open channels. Izv.VNIIG no.38:114-121 '48.
(Hydraulics)

DUL'NEV, V. B.

SOKKRIN, P. I. - Inzh. i BAUMGART, V. C. - Prof. i DUL'NEV, V. B. - Kand. Tekhn.,
Mauk St. Mauchn. Sotr.

Vsesoyuznyy nauchno-issledovatel'skiy institut gidrotekhniki im. B. Ye. Vedeneyeva.
Ratsionalizatsiya konstruktsiy otstoynykh sooruzheniy Page 85

SO: Collection of Annotations of Scientific Research Work on Construction, completed in 1950.
Moscow, 1951

RAUMGART, V.S., professor; DUL'NEV, V.B., starshiy nauchnyy sotrudnik.

Control of detritus and trash in designing diversion hydroelectric power stations on mountain rivers. Izv.VNIIG no.43:3-13 '50.
(Hydroelectric power stations) (MLRA 10:2)

1. BUL'NEV, V. B., Eng.

2. USSR (600)

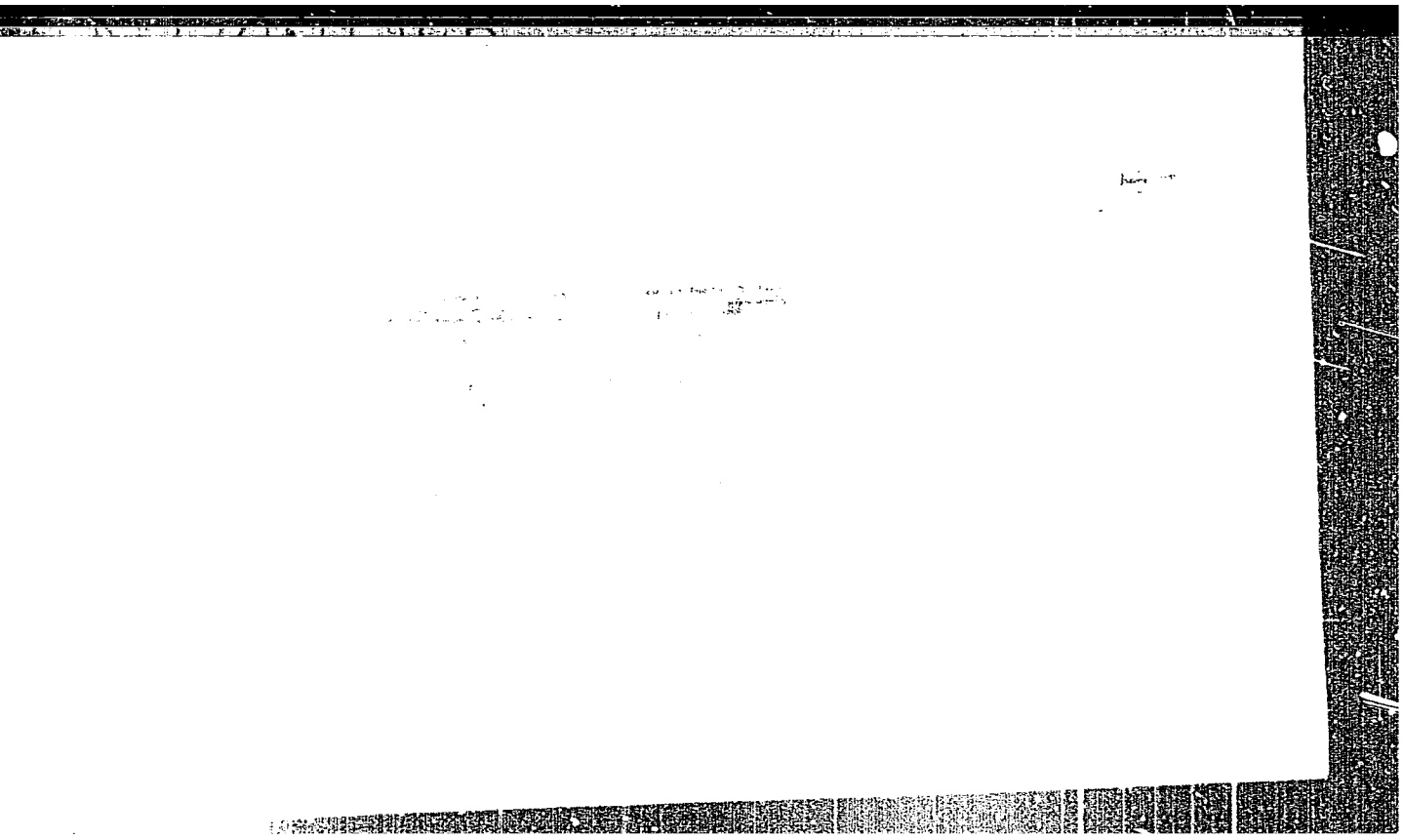
4. Sedimentation and Deposition

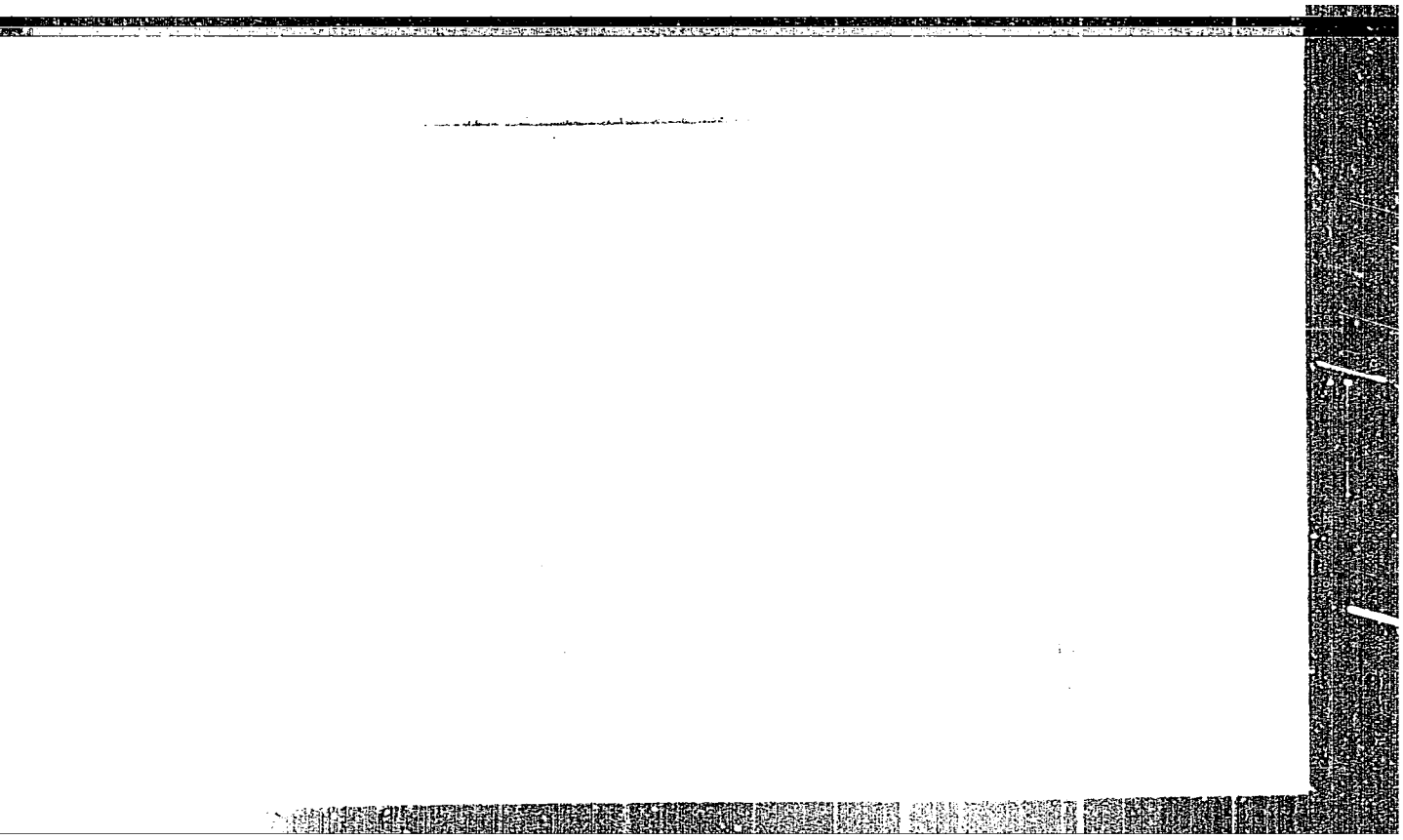
7. Calculations for the sedimentation basin of a hydroelectric power plant. Gidr. stroi. 22, No. 2, 1953.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

DUL'NEV, V.B., kandidat tekhnicheskikh nauk.

Controlling the condition of diversion hydroelectric power plants. Gidr. stroi. 22 no.8:29-31 Ag '53. (MLRA 6:8)
(Hydroelectric power stations)





124-1957-2-1895

Translation from: Referativnyy zhurnal, Mekhanika, 1957, Nr 2, p 60 (USSR)

AUTHOR: Dul'nev, V.B.

TITLE: The Stationary Nonuniform Motion of a Liquid in Open Non-prismatic Channels With Walls Having a Straight-line Planform (Ustanovivsheyesya neravnomernoye dvizheniye zhidkosti v otkrytykh neprizmaticheskikh ruslakh s pryamolineynymi v plane stenkami)

PERIODICAL: Izv. Vses. n.-i. in-ta gidrotekhn., 1955, Nr 54, pp 38-53

ABSTRACT: The Author examines a hydraulic design method for open non-prismatic channels in which the longitudinal change of the bottom width b is expressed by the linear relationship:

$$b = b_0 \pm 2 \tan \theta s = b_0 \pm as \qquad (1)$$

where b_0 is the initial width of the bottom, θ is the angle, in the planview, between the direction of a wall and the axis of the channel. Bearing in mind Equation (1), the basic hydraulic equations for a stationary nonuniform, slowly changing movement of a liquid in an open channel having straight slopes, is expressed in the following form:

$$dh/ds = i_0 (1 - \mu/\tau^2)/(1 - N_k/N) \qquad (2)$$

Card 1/2

The Stationary Nonuniform Motion of a Liquid (cont.)

where $\mu = \mp \frac{\alpha a h C^2}{g \chi}$, $\tau = \frac{K}{K_o}$, $N_k = \frac{\alpha Q^2}{g}$, and $N = \frac{\omega^3}{B}$.

As a result of the investigation of the equation obtained, possible free-surface contours for widening, as well as for narrowing, channels were obtained. Analogous solutions are given by the A. for channels with reverse and zero slopes. Also, the A. introduces into his calculations the so-called critical depth, which divides a channel into depthwise zones of prevailing velocity head and prevailing static head, respectively(ref. also: Ovsepyan, V.M., Sb.nauch.tr. Yerevansk. politekhn. in-ta, 1955, Nr 9, pp 81-87). The integration of the differential equations obtained is done by a summation method by solving the equations at hand by a method of selection. In conclusion, several numerical examples on the plotting of free-surface contours for narrowing and widening channels are given.

G.A.Dzhimsheli

1. Inland waterwasy--Design 2. Fluid flow--Mathematical analysis

Card 2/2

DUL'NEV, V.B. (Leningrad)

Hydraulic jump in a variable discharge flow. Izv.AN SSSR.Otd. tekh.nauk no.1:47-53 Ja '56. (MLRA 9:5)
(Hydraulic jump)

DUL'NEV, V.B., kandidat tekhnicheskikh nauk.

Determining losses of pressure in trash racks. Gidr.stroi. 25 no.9:51-53 O '56. (MLRA 9:11)
(Hydroelectric power stations)

DUL'NEV, V.B., kandidat tekhnicheskikh nauk.

Uneven flow of fluid in open nonprismatic channels. Gidr.stroi. 26 no.6:49-50 Je '57. (MIRA 10:7)

(Hydraulics)

DUL'NEV, V.B.

98-58-5-14/33

AUTHOR: Dul'nev, V.B., Candidate of Technical Sciences

TITLE: The Loss of Pressure in Grates (O poteryakh napora v reshetke)

PERIODICAL: Gidrotekhnicheskoye Stroitel'stvo, 1958, Nr 5, pp 47-48 (USSR)

ABSTRACT: This is a critique of an article written by the Engineer A.G. Novikov ("Gidrotekhnicheskoye Stroitel'stvo", 1957, Nr 10). A large discrepancy between the theoretical calculations and the author's own measurements regarding the losses of pressure in grates was found, and it is recommended that the VODGEO formula be rejected. The author finds that the material provided by Engineer Novikov is not sufficient to eliminate existing formulae. The question of pressure losses in grates is highly complicated because of the large number of influencing factors. Further study based on the analysis of physical phenomena is needed, in order to obtain more accurate results.
There is 1 table and 2 Soviet references.

AVAILABLE: Library of Congress

Card 1/1

98-58-7-14/21

AUTHOR: Dul'nev, V.B., Candidate of Technical Sciences

TITLE: Remarks on Methods of Studying the Operational Experience of Hydrotechnical Structures of Hydroelectric Power Plants (Zamechaniya po metodike izucheniya opyta gidrotekhnicheskikh sooruzheniy GES).

PERIODICAL: Gidrotekhnicheskoye stroitel'stvo,1958,Nr 7,pp 43-44(USSR)

ABSTRACT: Engineers S.S. Obrezkov and Ye.S. Matveyev published an article under this title, in the 1957 Nr 6 issue of this periodical. They proposed a method by which such studies could be made. The author of this article finds that the method proposed by them does not give a complete picture of the basic characteristics of different hydraulic systems and proposes the addition of several other specific features. The author refers to the case of the Ordzhonikidze Hydroelectric Plant on the Terek river. He finds that difficulties in operating this plant could have been avoided if the designers had taken into consideration experience gained in the construction and operation of the Arkhn-Churt hydroelectric power plant located 15 km farther down stream on the same river. The VNIIG imeni Vedeneyev has prepared for publication a special handbook for determining the spe-

Card 1/2

Remarks on Methods of Studying the Operational Experience of Hydrotechnical Structures of Hydroelectric Power Plants.

cific hydraulic characteristics of different operational hydroelectric power plants, in which the simplest methods and means of conducting tests and measurings are described. There is 1 Soviet reference.

1. Power plants--Operation 2. Power plants--Study and teaching

Card 2/2

DUL'NEV, V.B., starshiy nauchnyy sotrudnik, kand.tekhn.nauk

Computing the discharge of water through sluice gates. Izv. VNIIG 61:159-166 '58. (MIRA 13:6)
(Sluice gates)

DUL'NEV, Viktor Borisovich; GIRSHKAN, I.A., red.

[Determining actual properties of hydraulic structures of hydroelectric power stations] Opredelenie naturnykh kharakteristik gidrotekhnicheskikh sooruzhenii GES. Moskva, Gos. energ.izd-vo, 1959. 54 p. (MIRA 13:3)
(Hydraulic engineering)

DUL'NEV, V.B. (Leningrad)

Design of hydraulic pressure water pipes with variable discharge along their path. Izv. AN SSSR. Otd.tekh.nauk. Energ. i avtom. no.4:152-158 Jl-Ag '59. (MIRA 12:11)
(Water pipes)

SOV/98-59-7-9/22

8(6), 14(6)

AUTHOR: Dul'nev, V. B., Candidate of Technical Sciences

TITLE: Combatting Abrasive Erosion of Hydro-Electric Turbines

PERIODICAL: Gidrotekhnicheskoye stroitel'stvo, 1959, Nr 7, pp 40 - 43 (USSR)

ABSTRACT: The article is a discussion on the problem of the erosion of hydro-electric turbines due to alluvial deposits - a complex and little explored field of hydraulic engineering in which little progress has so far been made. The first part deals with the shortcomings of the method used to prevent erosion, namely, that of protecting the turbines by expensive sedimentation basins. This has proved to be not totally effective, erosion being observed even on machines not equipped with good sedimentation plants. In addition, the article stresses that: 1) the total annual amount of alluvial deposits passing through the GES unit is of greater importance than maximum alluvial content at time of floods, etc., due to the slow erosive action of the alluvia; 2) experiments have shown that

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the "dangerous dimensions" of particles, hitherto held to be 0.25-0.4mm, must be revised to take into account the hardness of the mineral content as well as the size; and 3) the irregular flow of alluvia (60-90% of it taking place in the summer period) must also be taken into consideration, and repairs and overhauls carried out accordingly. Experiments carried out at the VNIIG laboratories indicate that the factors causing abrasion are: a) the hardness of the particles and the subject of erosion; b) the duration of the action of the abrasive particles and their concentration; c) the speed of the motion of the water; and d) the shape and size of the particles. The author then proceeds to review the method of research used in the experiments, stressing the inefficacy of theoretical, laboratory tests, in view of which a number of GES in the Caucasus and Soviet Central Asia were subjected to practical study by members of the VNIIG imeni Vedeneyev. . Since the turbines subject to corrosion were made of steel with a hardness of 4-5.5 (Mohs

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Scale), only mineral particles of a hardness of 4 or more were considered to be dangerous. The data obtained was used to establish a link between the permissible amount of erosion of the main parts of the turbines and the average annual concentration of hard particles in the water ($P_{hardness}$), the number of hours worked per annum by a turbine (T), pressure (H), etc. A graph is given showing the relation between the turbidity of the water and the frequency of major repairs on the turbines, expressed by the equation $P_{hardness} = f(H)$, for the application of which the proviso is made that the affected parts of the turbine be made of carbon steel. With the aid of this graph the permissible turbidity of the water for the mean hydrological year may be calculated and experiments on the ZA GES plants show that it is also applicable to propellor turbines, in additional to radial-axled ones. Data is also given of tests conducted at the Gizel'donskaya GES. Conclusions drawn from the experiments are then enumerated: 1) The

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use of expensive sedimentation basins, hitherto used, is not justified; more attention should be paid to the production of high-quality steel; 2) the yearly repair and overhaul of turbines is recommended; and 3) the need for more research on the subject is stressed. There is 1 graph.

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